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Improvement of inter-budget relations as a direction to increase the financial stability of single-industry towns of the Russian Federation

Mejora de relaciones interpresupuestarias como política para aumentar estabilidad financiera de ciudades de industria única de la Federación Rusa

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Content

ABSTRACT:

The purpose of this article is to develop and substantiate a comprehensive methodological approach to performance evaluation of fiscal sharing between budgets of different level as a direction for improving the financial stability of single-industry cities in the Russian Federation. The research of the claimed problem is based on a complex of statistical analysis methods, which includes the correlation method and the average values method. Using correlation analysis tools, the relationship, its nature and direction between the federal, regional, local taxes revenues volume and taxes paid in connection with the application of special tax regimes, and the integrated index values of single-industry town budget solvency. The average values method is used to calculate the optimal values of the tax revenues deduction norms, under which the maximum integral index increase characterizing the

RESUMEN:

El propósito de este artículo es desarrollar y fundamentar un enfoque metodológico integral para la evaluación del desempeño y distribución fiscal entre los presupuestos de diferentes niveles como una política para mejorar la estabilidad financiera de las ciudades de industria única en la Federación Rusa. La investigación del problema reseñado se basa en un complejo de métodos de análisis estadístico, que incluye el método de correlación y el método de valores promedio. Utilizando herramientas de análisis de correlación, la relación, su naturaleza y dirección entre el volumen de ingresos por impuestos federales, regionales y locales e impuestos pagados en relación con la aplicación de regímenes fiscales especiales, y los valores de índice integrados de la solvencia presupuestaria de una sola industria. El método de valores promedio se utiliza para calcular los valores óptimos de las normas de deducción

subnational entities financial stability is observed, as well as the economical balance of all administration levels and tax payers. The article reflects the results of the development and justification of a fundamentally new integrated methodological approach to performance evaluation of the current system of fiscal sharing between the budgets of different levels by comparing the criteria proposed by the authors for the "budget tax revenues" and the "financial stability integral index", and presents its systematic mathematical algorithm.

Keywords: budget, correlation dependence, inter-budget relations, local taxes, single-industry towns, tax revenues, regional taxes, federal taxes, financial stability.

de ingresos tributarios, bajo los cuales se observa el máximo índice integral que caracteriza a las entidades subnacionales, la estabilidad financiera, así como el equilibrio económico de todos los niveles de administración y contribuyentes. El artículo refleja los resultados del desarrollo y la justificación de un enfoque metodológico integrado fundamentalmente nuevo para la evaluación del desempeño del sistema actual de distribución fiscal entre los presupuestos de diferentes niveles al comparar los criterios propuestos por los autores para los "ingresos fiscales" y el "índice integral de estabilidad financiera", y presenta su algoritmo matemático sistemático.

Palabras clave: presupuesto, dependencia de correlación, relaciones entre presupuestos, impuestos locales, pueblos de una industria, ingresos tributarios, impuestos regionales, impuestos federales, estabilidad financiera

1. Introduction

Modern economic situation demonstrates a severe asymmetry in the financial evolution of multi- and single-industry subnational entities of the Russian Federation, which is due to the chronic shortage of own resources to cover budget expenditure items of the latter. The level equalizing state-used horizontal and vertical instruments of territories' financial capacities oriented toward income producing powers distribution between the Russian Federation, the subjects of the Russian Federation and municipalities, lead to a high level of revenues centralization in the federal budget and, accordingly, to negative consequences. The negative consequences of the national budgetary practice are resource dependence on the higher level, a decrease in the interest of single-industry town authorities to expand own income base, as well as the temptation to increase the expenditures amount and local budgets deficit. It should be noted that "many fiscally decentralized economies rely heavily on transfers from upper to lower-level governments as well as on equalizing transfers between lower-level governments" (Lundqvist, 2015).

Achieving the financial stability for a single-industry town requires, first of all, development and implementation of incentive mechanisms to encourage modern territories to make efforts for increasing the total resource base, forming and strengthening their tax potential (Uvarova, 2013; Golovina, 2013). Doubtlessly, the stated problem is realized and discussed at different governmental levels. However, in the author's opinion, the problem cannot be resolved at a qualitative level without a comprehensive study of the performance evaluation of the current system of fiscal sharing between the budgets of different levels as areas for improving the Russian single-industry town financial stability, and also without cooperation with the scientific community (Balynskaya, 2013). The current mechanism for inter-budget relations evaluation does not reflect the real resource availability of the territory and distorts the rating of its social and economic dynamics (Zenchenko, 2009).

Moreover, in the course of analyzing the researched problem development degree, it was revealed that there are practically no publications on the development of approaches to performance evaluation of inter-budget equalization systems of Russian single-industry town financial capacity and publicizing their approbation results. Most of the works are based on an analysis of certain criteria for the distribution quality of subnational entities income producing powers and do not affect the issues of conducting a consolidated assessment. These works include the papers by I.A. Avetisyan (2011), R. Bahl and J. Linn (1986, 1994), R.V. Badylevich and E.A. Verbinenko (2013), R. Boadway, K. Cuff and M. Marchand (2003), A. Chernyavsky and K. Vartapetov (2004), W. Jack (2005), A.G. Vasiliieva et al. (2017), S.V. Zenchenko (2009), A.V. Kizeev (2011), P. Liberati and A. Sacchi (2013), H. Lundqvist (2015), I. Marques, E. Nazrullaeva and A. Yakovlev (2016), L.R. Mello (1999, 2000), P.B. Nortman (1971), M.A. Pechenskaya and T.V. Uskova (2012), E.B. Staats (1974) and others.

The above-mentioned circumstances determined the relevance and practical importance of the scientific research, within the framework of which, a comprehensive methodological approach to the performance evaluation of the current system of fiscal sharing between the budgets of different levels as areas for improving the Russian single-industry towns financial stability was substantiated. The research was made in a large industrial center and a single-industry town in the Chelyabinsk Region – Magnitogorsk, which arose on the wave of epoch-making social transformations as a settlement at a metallurgical plant (Turgel and Vlasova, 2016).

2. Research Methods

The proposed consolidated methodology for the economic and statistical performance evaluation of the current system of fiscal sharing between the budgets of different levels as areas for improving the Russian single-industry town financial stability is based on the following stages:

In the first stage, a statistical study reveals and analyzes the relationship between the tax revenues volume for federal, regional, local taxes, as well as taxes paid in connection with the application of special tax regimes, and the Russian single-industry town budget financial stability integral index values. Note that it is in the process of statistical investigation of dependencies that causal relationships between phenomena are revealed - "the connection of phenomena and processes, when a change in one of them - causes - leads to a change in the other - the effect" (Vasiliieva, 2011).

It is proposed to highlight the factor attributes and the performance indicators necessary for the study to identify the existence of the relationship, its nature and direction between federal, regional and local tax revenues, as well as special tax regimes in the territorial formation budget, and the financial stability integral measure. The authors recommend accepting the revenues amounts for federal, regional and local taxes, as well as for special tax regimes in the local budget as an analysis factor, and a single-industry town financial stability integral indicator as an effective indicator.

The relationship tightness is quantitatively expressed by the correlation coefficients magnitude, including the correlation relationship tightness between tax revenues and the integral index of single-industry town financial stability can be measured by the determination coefficient . The determination coefficient is the indicator representing an inter-group dispersion share relative value in the overall effective indicator variance and reflecting the strength of the factor sign influence on the effective indicator overall variation formation (Vasiliieva, 2011):

$$R^2 = \frac{\delta^2}{\sigma^2}, \qquad (1)$$

where δ^2 is the standard deviation of the effective characteristic aligned values;

σ^2 is the standard deviation of the effective characteristic actual values.

Qualitative relationship tightness evaluation is based on the determination coefficient indicator usually applied the Cheddock ratio presented in Table 1.

Table 1. Cheddock ratio

	0.1-0.3	0.3-0.5	0.5-0.7	0.7-0.9	0.9-0.99
Relationship tightness	Weak	Average	Noticeable	Close	Rather close

The second stage offers to calculate the tax revenues normative deduction optimal values under which the maximum subnational entity financial stability integral indicator increase is observed, and also the balance of economic interests of all government and taxpayers levels is maintained with the help of the arithmetic mean weighted:

$$\bar{x} = \frac{x_1 f_1 + x_2 f_2 + \ldots + x_n f_n}{f_1 + f_2 + \ldots + f_n} = \frac{\sum xf}{\sum f}, \tag{2}$$

where $f_1, f_2 \ldots f_n$ is the weight (the frequency of repetition of the same signs);

$\sum xf$ is the sum of the characteristics products magnitude by their frequencies;

$\sum f$ is the total amount of unit in the aggregate.

Calculation of the optimal values of normative deductions of Russian single-industry town budget tax revenues is recommended to be complemented by the identification of similar values at the current date and their comparison.

3. Results

The article attempts to assess the feasibility of the practical application of the performance evaluation integrated approach of financial capacities level equalizing state-used instruments on the example of a large industrial center and a single-industry town in the Chelyabinsk Region of the Russian Federation – Magnitogorsk. In this regard, N.A. Kharitonova, E.N. Kharitonova and N.L. Levinson note the following: "Economic restructuring within the Russian Federation has considerably reduced the number of industrial giants, many of which proved unviable in the new economic conditions. However, those that remain are leaders in Russian industry, and their success determines the life not only of the local municipalities but often also of the whole region where they are located; as before, they continue to determine the economic and industrial potential of the region" (Kharitonova et al., 2007).

The rationality of selecting the research place is determined not only by the subnational entity single-industry nature, but also by the high resource dependence of the Magnitogorsk budget identified by the authors from a higher level, and by the gradual decrease in the municipal authorities interest to expand own income basis. In particular, in 2012 the single-industry town budget tax revenues were almost equivalent to inter-budget transfers - 42.08% versus 50.18%, whereas in 2016 the gap between tax revenues and inter-budget transfers significantly increases - 25.90% versus 66, 09%, which is graphically represented in Figure 1 (Turgel et al., 2016).

Figure 1. Single-industry town budget
revenues structure in 2012-2016, in percent
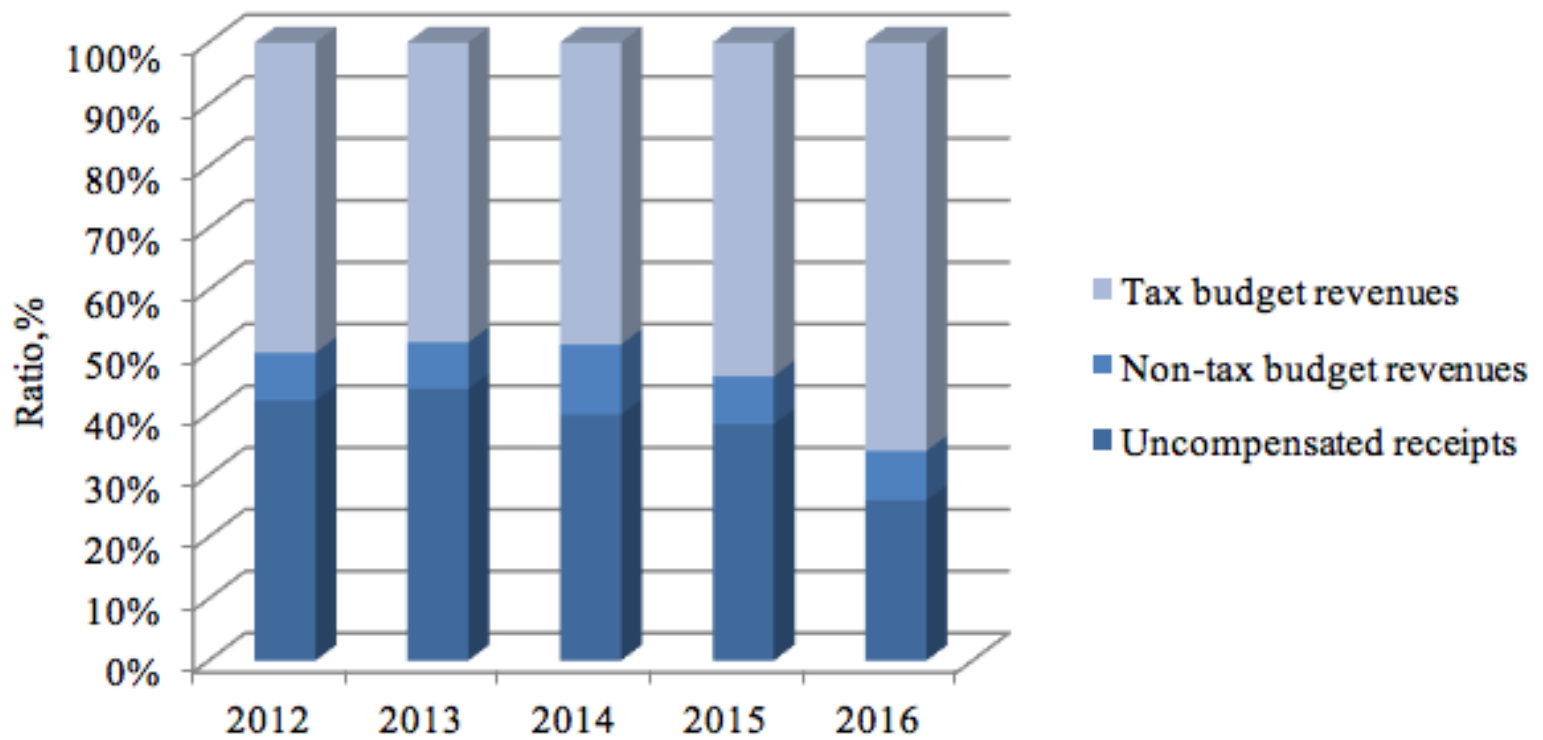
The results of the first stage, which involves the identification of the relationship between federal, regional and local taxes, as well as special tax regimes to the single-industry town budget and the financial stability integral index using the determination coefficient, are presented in Table 2 and Figures 2-5.

Table 2. Relationship degree of tax revenues and financial stability integral index of a single-industry town budget

Factor, X	Result, Y	Relationship existence	
			Relationship tightness
Revenue amount in budgets under federal taxes	Budget financial stability integral indicator	0.8538	Close
Revenue amount in budgets under regional taxes		0.8712	Close
Revenue amount in budgets under local taxes		0.9898	Rather close
Revenue amount in budgets under special tax regimes		0.9799	Rather close

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Figure 2. Dependence between federal tax revenues and the financial stability integral index of a single-industry town budget
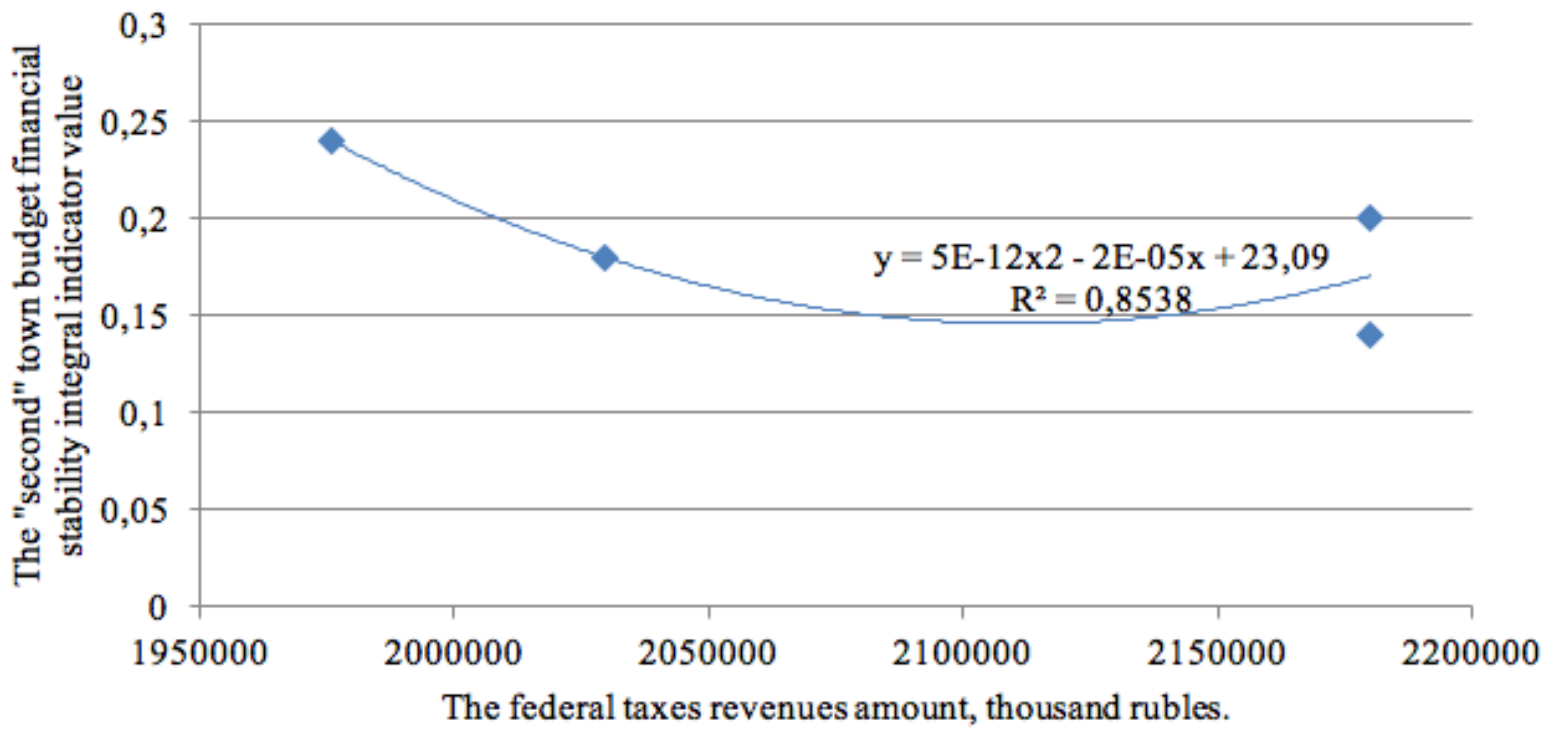
Figure 3. Dependence between regional tax revenues and the financial stability integral index of a single-industry town budget
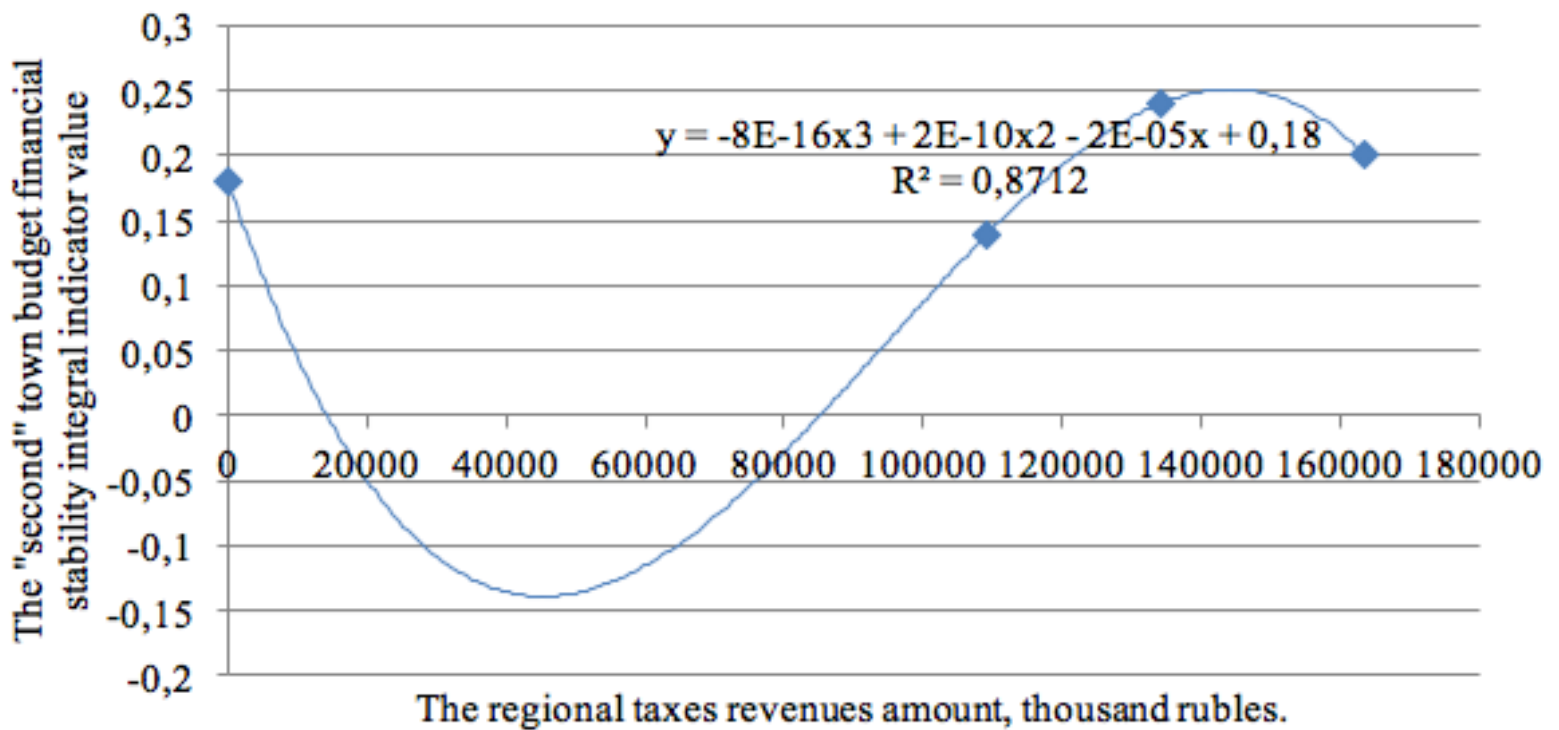

Figure 4. Dependence between local tax revenues and the financial stability integral index of a single-industry town budget

The "second" town budget financial stability integral indicator value

The local taxes revenues amount, thousand rubles.

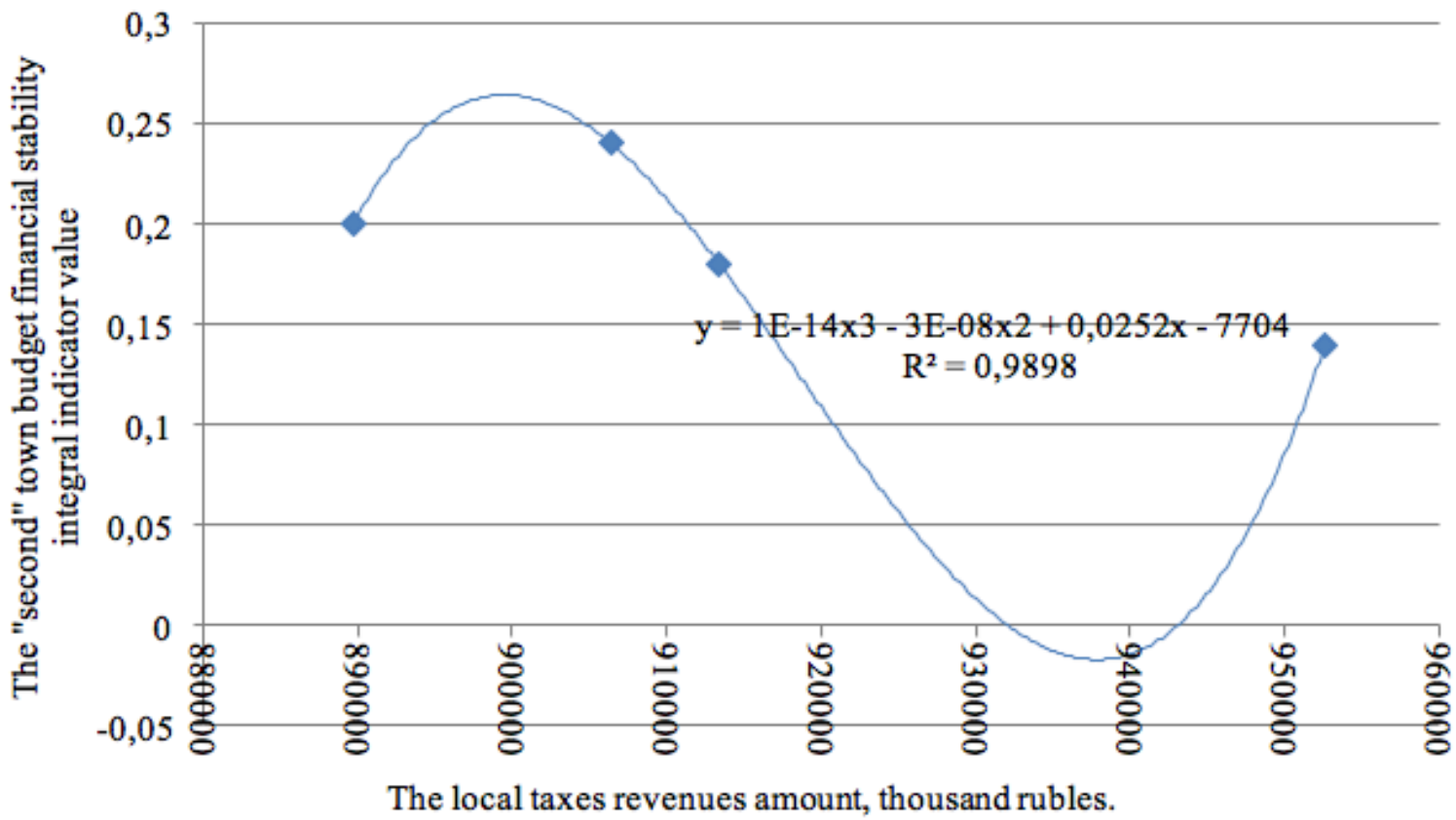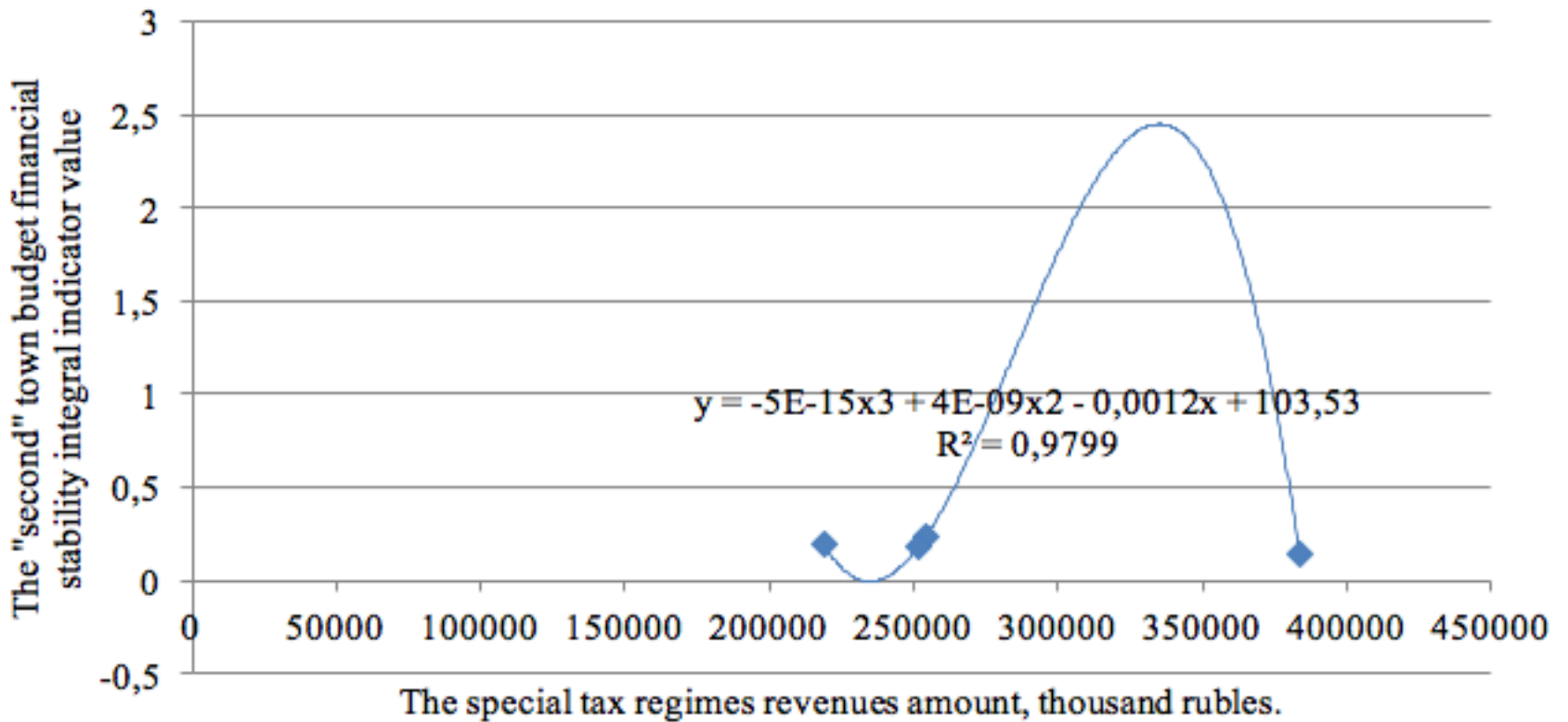$y = 1E\text{-}14x3 - 3E\text{-}08x2 + 0{,}0252x - 7704$

$R^2 = 0{,}9898$

Figure 5. Dependence between special tax regimes revenues and the financial stability integral index of a single-industry town budget

The "second" town budget financial stability integral indicator value

The special tax regimes revenues amount, thousand rubles.

$y = -5E\text{-}15x3 + 4E\text{-}09x2 - 0{,}0012x + 103{,}53$

$R^2 = 0{,}9799$

Since the determination coefficient shows the Y resultant sign variation share under the X sign factor influence, the determination coefficient calculated values analysis indicates a close functional relationship between the tax revenues level in the local budget and the Magnitogorsk budget financial stability integral indicator. In particular: local budget financial stability integral index variation by 85.38% is due to a change in the federal taxes revenues level and other factors by 14.62%; local budget financial stability integral index variation by 87.12% is due to a change in the regional taxes revenues level and other factors by 12.88%; local budget financial stability integral index variation by 98.98% is due to a change in the local taxes revenues level and other factors by 1.02%; local budget financial stability integral index variation by 97.99% is due to a change in the special tax regimes revenues level and other factors by 2.01%.

The final results of the second stage, which involves the tax revenues normative deduction optimal values identification, under which the maximum increase in the integral index of single-industry town financial stability is observed, using the arithmetic mean weighted, are presented in Table 3.

Table 3. Degree of compliance of the normative tax revenues deductions to the single-industry town budget with the financial stability requirements

Result, Y	Factor, X	Optimum level of tax deductions to the town budget,%
Budget financial stability integral indicator	Normative deductions to budgets under federal taxes	
	Personal income tax	30.0
	State duty	100.0
	Normative deductions to budgets under regional taxes	
	Transportation tax	50.0
	Gambling tax	40.0
	Normative deductions to budgets under local taxes	
	Land tax	100.0
	Personal income tax	100.0
	Normative deductions to budgets under special tax regimes	
	Uniform tax on imputed income for certain activities	100.0
	Unified agricultural tax	100.0
	The tax levied with the taxation patent system application	100.0

The calculation results show that the optimal tax revenues deductions amount to Magnitogorsk's budget, which stimulates subnational entity financial stability, is at the level of the year of 2013 and significantly differs from the normative values provided for by the Budget Code of the Russian Federation (1998), which is systematized in Table 4.
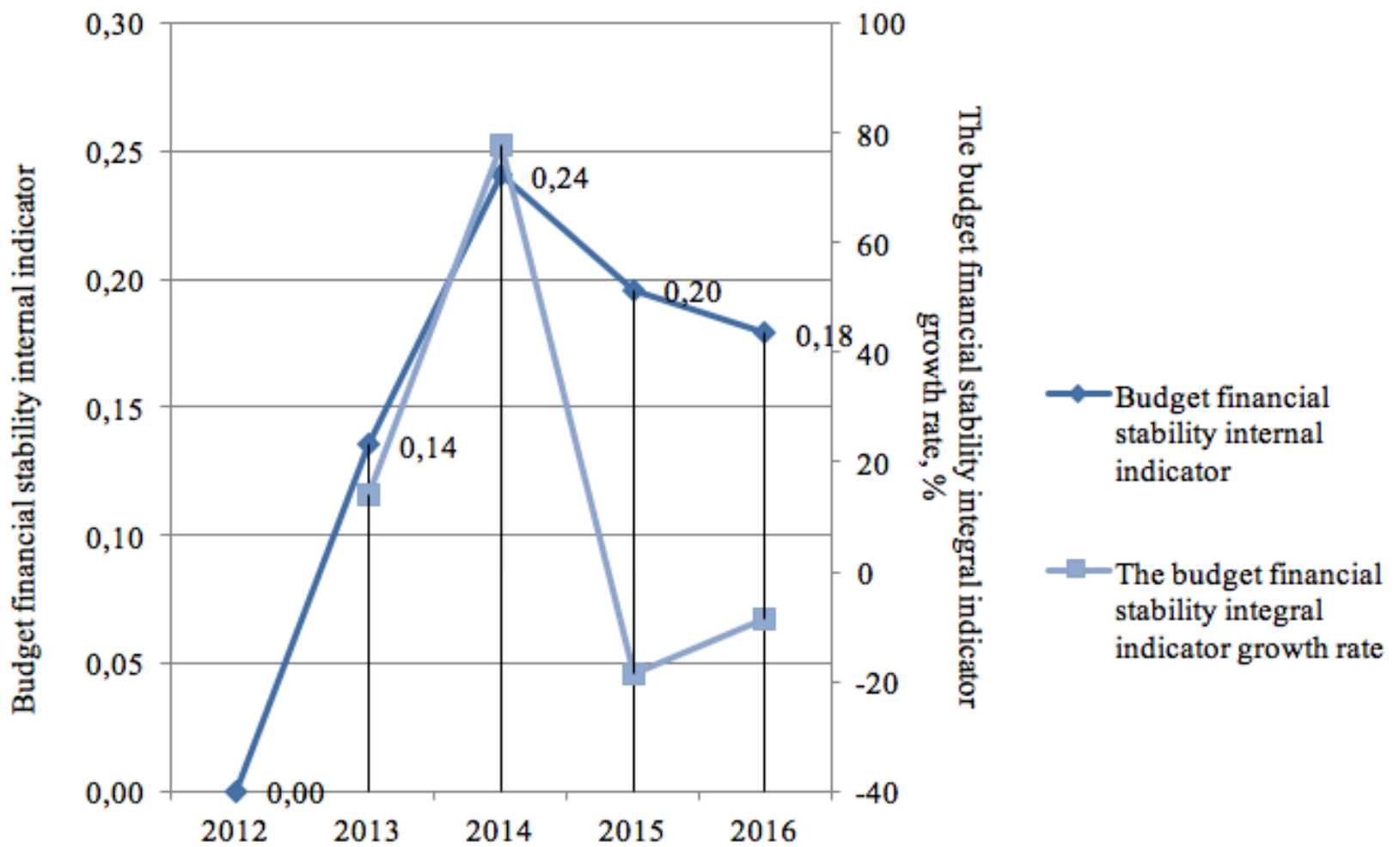
Table 4. Normative deductions to local budgets established by the budget legislation

Taxes and fees established by the legislation of the Russian Federation	Normative deductions to the town budget, %	
	2013	2016

Federal taxes and fees		
Personal income tax	30.0	15.0
State duty	100.0	100.0
Excises on automobile and straight-run gasoline, diesel fuel, motor oils for diesel and (or) carburetor (injector) engines produced in the territory of the Russian Federation	-	10.0
Regional taxes and fees		
Transportation tax	50.0	-
Gambling tax	40.0	-
Local taxes		
Land tax	100.0	100.0
Personal income tax	100.0	100.0
Special tax regimes		
Uniform tax on imputed income for certain activities	100.0	100.0
Unified agricultural tax	100.0	100.0
The tax levied with the taxation patent system application	100.0	100.0

Moreover, the calculation results are confirmed by the maximum values of the integral indicator of single-industry town budget financial stability and town's growth rate achieved in 2013, which is graphically reflected in Figure 6.

Figure 6. Dynamics of the values and growth rates of the single-industry town budget financial stability integral indicator in 2012-2016

The graph shows the y-axis labeled "Budget financial stability internal indicator" ranging from 0,00 to 0,30, and a secondary y-axis labeled "The budget financial stability integral indicator growth rate, %" ranging from -40 to 100. The x-axis shows years 2012 to 2016. Data points for "Budget financial stability internal indicator" are labeled: 0,00 (2012), 0,14 (2013), 0,24 (2014), 0,20 (2015), 0,18 (2016). Legend: "Budget financial stability internal indicator" and "The budget financial stability integral indicator growth rate".

4. Conclusion

The authors made the following principal result in the process of achieving the stated purpose of the study, which consisted in improving the existing methodological approaches to performance evaluation of the current fiscal sharing system applicable for different level budgets as a direction for improving the financial stability of company towns in the Russian Federation.

Following the results of comparative analysis of the diversity of approaches to performance evaluation of inter-budget equalization systems of Russian single-industry town financial capacity, it was revealed that to date, the majority of the works is based on analyzing certain quality criteria for subnational entities income producing powers distribution, also the publications on the complex research methods are also virtually not present. The authors of the article attempted to eliminate the indicated gap in modern financial science by developing and substantiating a comprehensive methodological approach to Russian current inter-budget relations system performance evaluation.

The proposed consolidated methodology for the economic and statistical evaluation of the current system of fiscal sharing between the budgets of different levels as areas for improving the Russian single-industry town financial stability is based on the following stages:

- Statistical study of the existence of a link, its nature and direction between the tax revenues volume for federal, regional, local taxes, as well as taxes paid in connection with the special tax regimes applications, and the Russian integral index of single-industry town financial stability values by finding the factor and performance indicators and calculating the correlation coefficient;

- Calculation of the optimal values of the tax revenues deduction norms, under which the maximum integral index increase characterizing the subnational entities financial stability is observed, as well as the economical balance of all administration levels and tax payers.

- Performance evaluation of Russian single-industry town inter-budget relations by identifying values of the deduction norms of single-industry town tax revenues at the current date and their comparison with the optimal values.

Approbation of the proposed criteria and the presented approach to the evaluation of the effectiveness of the performance evaluation of the current fiscal sharing system applicable for different level budgets, accounting for the "budget fiscal revenues" and the "financial stability integral index", confirmed the significance of the achieved results. The proposed method for performance evaluation of the current fiscal sharing system applicable for different level budgets will allow for regular monitoring the compliance of territorial fiscal policy performance actual indicators with optimal values, increase the municipal authorities interest in reducing resource dependence from a higher level.

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